

US009885147B2

(12) United States Patent

Cassidy et al.

(54) REPRODUCIBLE SAMPLE PREPARATION METHOD FOR QUANTITATIVE STAIN DETECTION

(71) Applicant: UNIVERSITY OF SOUTH
CAROLINA, Columbia, SC (US)

(72) Inventors: Brianna Cassidy, Columbia, SC (US);
Zhenyu Lu, Columbia, SC (US);
Katherine Witherspoon, Columbia, SC (US); Alena Bensussan, Monroe, CT (US); Jennifer Martin, Pelion, SC (US); Stephanie Dejong, Ripon, CA (US); Michael Myrick, Columbia, SC (US); Stephen L. Morgan, Columbia, SC (US); Wayne L. O'Brien, Port Arthur, TX (US); MacKenzie

(73) Assignee: University of South Carolina,

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 103 days.

Columbia, SC (US)

Meece-Rayle, Austin, TX (US)

(21) Appl. No.: 15/136,217

(22) Filed: Apr. 22, 2016

(65) **Prior Publication Data**US 2016/0313225 A1 Oct. 27, 2016

Related U.S. Application Data

- (60) Provisional application No. 62/152,065, filed on Apr. 24, 2015.
- (51) Int. Cl. G01N 33/49 (2006.01) D06M 15/248 (2006.01) D06M 23/16 (2006.01)

(10) Patent No.: US 9,885,147 B2

(45) **Date of Patent:**

Feb. 6, 2018

D06N 3/06 (2006.01) *G01N 1/28* (2006.01)

(52) U.S. Cl.

CPC *D06M 15/248* (2013.01); *D06M 23/16* (2013.01); *D06N 3/06* (2013.01); *G01N 1/28* (2013.01)

(56) References Cited

U.S. PATENT DOCUMENTS

3,562,524	Α		2/1971	Moore et al.	
3,684,867	Α		8/1972	Acker	
3,783,284	Α		1/1974	McCormack	
4,201,914	Α		5/1980	Perren	
4,292,272	Α	*	9/1981	Kitajima	G01N 33/525
				-	422/428

(Continued)

OTHER PUBLICATIONS

Andrasko, J., "The estimation of the age of bloodstains by HPLC analysis," *J. Forensic. Sci.*, (1997) 42 (4) pp. 601-607.

(Continued)

Primary Examiner — Cachet I Sellman (74) Attorney, Agent, or Firm — Dority & Manning, PA

(57) ABSTRACT

A stain-barrier is described along with methods of its application to a fabric. The stain barrier can be applied to fabric samples and limits the amount of fabric with which deposited liquid is able to interact. This stain barrier reduces unwanted variability between samples of different dilution or fabric type so that limits of stain detection can be assigned more accurately and precisely and stain detection techniques can be transparently compared.

14 Claims, 6 Drawing Sheets

